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Abstract

With unique possibilities for controlling light in nanoscale devices, graphene has opened new perspectives to the nanophotonics community with potential applications in metamaterials, modulators, photodetectors, and sensors. Following a brief introduction of graphene, I will first present some fundamental work of graphene nanophotonics,, e. g., excitation of graphene plasmon polartions [1], pushing graphene plasmons to low wavelengths [2], investigating of graphene plasmon-phonon interactions[3], and light-matter interactions in graphene-metal hybrid structures [4]. Then I will review our recent activities on novel integrated graphene-based optoelectronic devices including graphene based silicon ring-resonator modulators[5], graphene plasmonic waveguide modulators[6], and high-energy-efficiency graphene microheats[7].

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